



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/619,408	07/15/2003	Yoshinobu Hasuka	SIW-063RCE	7646

7590 01/25/2007  
LAHIVE & COCKFIELD, LLP  
28 STATE STREET  
BOSTON, MA 02109

EXAMINER
----------

COOLMAN, VAUGHN

ART UNIT	PAPER NUMBER
----------	--------------

3618

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/25/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/619,408	HASUKA ET AL.	
	Examiner	Art Unit	
	Vaughn T. Coolman	3618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 4-7, 10 and 11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 4-7, 10 and 11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

Applicant is advised that the new examiner of record is Travis Coolman to whom all further correspondence should be directed. Contact information can be found in the "Conclusion" section of this correspondence.

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 12/12/2006 has been entered.

#### ***Allowable Subject Matter***

Applicant is advised that the Notice of Allowance mailed is vacated. If the issue fee has already been paid, applicant may request a refund or request that the fee be credited to a deposit account. However, applicant may wait until the application is either found allowable or held abandoned. If allowed, upon receipt of a new Notice of Allowance, applicant may request that the previously submitted issue fee be applied. If abandoned, applicant may request refund or credit to a specified Deposit Account.

The indicated allowability of all previously pending claims is withdrawn in view of the newly discovered reference(s) to Nonobe and Aberle et al. Rejections based on the newly cited reference(s) follow.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 4-7, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nonobe (WO01/34424 and corresponding U.S. Patent No. 6,158,537) in view of Aberle et al (U.S. Patent No. 6,777,909 B1).**

**[claim 4]** Nonobe discloses a fuel cell vehicle (15) equipped with a fuel cell(20), an idle control system (50), a driving motor (32), a power storage device (30), a hydrogen supply device (64), an air compressor (66) and auxiliary equipment (34), a method of generating electrical current comprising the steps of:

identifying the occurrence of an idle state (Column 11, lines 44-54), said idle state being based on the expected power consumption of the driving motor being lower than a predetermined value or an electrical power load of an electrical load being lower than a predetermined value;

selecting a power generation mode in response to the occurrence of the idle state; and

adjusting the power generation of, the fuel cell based on the selected power generation mode using said idle control system, wherein the selection of a power generation mode includes the further steps of;

selecting an idle charge mode (Column 11, lines 55-60), said idle charge mode being selected based on a determination that said power storage device does not exceed a predetermined parameter (Column 11, line 57); and

adjusting the electrical current generated by the fuel cell (Column 14, lines 18-34)

Nonobe does not disclose adjusting said electrical current according to an optimum power generation efficiency of the fuel cell or the details of such a method.

Aberle teaches a method of determining optimum power generation efficiency based on identified parameters of the components of a fuel cell vehicle. Aberle teaches the concept that the efficiency of a fuel cell system can be increased by operating the fuel cell at high power during periods of low power demand (idle – column 5, line 11) while charging a power storage device. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fuel cell idle method shown by Nonobe with the power generation efficiency parameters as taught by Aberle, since such a modification would provide the advantage of storing power that can be used for acceleration or powering auxiliary systems while improving overall fuel efficiency at the same time.

The combination would disclose, as would have been obvious to one of ordinary skill in the art at the time the invention was made, the adjustment of the electrical current generated by the fuel cell to an optimum level according to said optimum power generation efficiency includes the further steps of:

Art Unit: 3618

determining a total electrical power generated by the fuel cell (taught by both Nonobe and Aberle);

subtracting an electrical power consumption of the air compressor (basic calculation – Nonobe discloses the fact that the operation of the compressor is powered by the fuel cell in column 14, lines 44-51 and acknowledges the importance of factoring it into efficiency);

dividing a result of the total electrical power generated by the fuel cell minus the electrical power consumption of the air compressor by the total electrical power generated by the fuel cell and multiplying an overall result by 100% to arrive at an efficiency percentage (basic engineering math common to one of ordinary skill in the art) and adjusting the power generated by the fuel cell based on said efficiency percentage (basic programming of the controller of either Nonobe or Aberle in order to maintain fuel efficiency at the best level possible whenever possible).

**[claim 5]** Nonobe further discloses the electrical power load of the electrical load including the power requirements of said driving motor, the power requirements of said air compressor used to supply hydrogen from said hydrogen supply to said fuel cell and the power requirements of said auxiliary equipment in said fuel cell vehicle (Column 8, line 47 thru column 9 line 12; column 14, lines 35-51).

**[claim 6]** Nonobe further discloses the selection of a power generation mode comprises the further steps of: selecting an idle stop mode, said idle stop mode being selected based on a determination that electrical power stored in said power storage device exceeds a predetermined parameter; and stopping the generation of electrical current by said fuel cell (Column 12, lines 31-41).

Art Unit: 3618

**[claims 7 and 11]** Nonobe further discloses identifying a need for increased electrical power while in said idle stop mode; and exiting said idle stop mode to return to a normal power generation mode, said normal power generation mode supplying electrical current directly from said fuel cell to said driving motor and said auxiliary equipment (Column 11, lines 30-43).

**[claim 10]** Nonobe further discloses said generated electrical current being stored in said power storage device (see above).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vaughn T. Coolman whose telephone number is (571) 272-6014. The examiner can normally be reached on Monday thru Friday, 8am-6pm EST.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Ellis can be reached on (571) 272-6914. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3618

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

vtc  02/17/07

Travis Coolman  
Examiner  
Art Unit 3618

  
CHRISTOPHER P. ELLIS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600